



### **STATUS OF CLAIMS**

Claims 1-24 are pending in the application. Claims 1-24 were originally presented in the application. Claims 1-24 stand rejected in view of several references as recited in the Appeal Brief. The rejection of claims 1-24 based on the cited references was appealed. All claims are pending as filed in the Appeal Brief.

### **GROUND OF REJECTION**

1. Claims 1-24 stand rejected under 35 U.S.C. §103(a) as being obvious over *Kornblit et al.* (U.S. Patent No. 5,948,570, hereinafter "*Kornblit*") in view of *Meyer et al.* (U.S. Patent No. 4,600,686, hereinafter "*Meyer*"). The Examiner has stated as evidence *Yasuzato et al.*, (U.S. Patent No. 5,750,290, hereinafter "*Yasuzato*"), which was not mentioned under Grounds of Rejection in any matter prior to the Examiner's Answer.

### **THE REFERENCES**

The Examiner relies on the following references:

Author	Publication Title or Reference number	Publication Date
<i>Kornblit et al.</i>	U.S. Patent No. 5,948,570	September 7, 1999
<i>Meyer et al.</i>	U.S. Patent No. 4,600,686	July 15, 1986
Evidence: <i>Yasuzato et al.</i>	U.S. Patent No. 5,750,290	May 12, 1998

### **BRIEF DESCRIPTION OF THE REFERENCES**

*Kornblit et al.* discloses etching a chromium layer with a gaseous mixture of oxygen gas, chlorine gas, and nitrogen as etchant species, in combination with a patterned organometallic resist. (See, Abstract, col. 2, lines 44-56, col. 4, lines 10-24) *Kornblit et al.* discloses that nitrogen is an essential constituent used in the etchant chemistry to dilute the oxygen gas and chlorine gas chemistry to minimize undercutting of the chromium layer and provide a more anisotropic etch pattern. (See, col. 4, lines 24-33)

*Meyer et al.* discloses depositing a chromium layer, depositing and patterning a photoresist, forming an etch resistant skin with a second chromium layer disposed over the patterned photoresist, baking the substrate so that the chromium reacts with the

photoresist, and etching the unreacted chromium. (See, Abstract, col. 2, lines 38-67, Figs. 1 and 2) *Meyer et al.* discloses etchant species of carbontetrachloride ( $\text{CCl}_4$ ) and oxygen gas. *Meyer et al.* further discloses carrier gases of argon and carbon monoxide. (See, col. 3, lines 3-16)

The reference of record, *Yasuzato*, presented as evidence by the Examiner, discloses chromium etching with a gas containing chloride (See, col. 2, lines 12-15, col. 8, lines 59-62).

## **ARGUMENT**

### **THE ISSUES UNDER 35 U.S.C. §103**

**THE EXAMINER ERRED IN REJECTING CLAIMS 1-24 UNDER 35 U.S.C. §103 BECAUSE THE SUBJECT MATTER OF *KORNBLIT*, ALONE OR IN COMBINATION WITH THE SUBJECT MATTER OF *MEYER* DOES NOT TEACH, SHOW, OR SUGGEST ETCHING A METAL, CHROMIUM, LAYER WITH CARBON MONOXIDE AND CHLORINE GAS.**

In response to the Applicants' argument regarding the respective subject matter of the *Kornblit* and *Meyer* references, The Examiner asserts that it would have been obvious to modify *Kornblit* by using carbon monoxide as taught by Meyer because each composition is useful for etching chromium. Applicants respectfully disagree with the Examiner's conclusions since the combined subject matter of the respective references does not suggest choosing select constituents to teach the composition of the method recited in claims 1-24.

*Kornblit*. discloses the use of oxygen gas and chlorine gas as specific etchant specie, and describes as critical, the use of nitrogen gas to dilute the etchant specie and to minimize undercut of chromium material being etched. In fact, the critical use of nitrogen specifically in combination with chlorine and oxygen in *Kornblit* teaches away from the use of other compounds, such as carbon monoxide. By contrast, *Meyer* discloses that the chromium disposed on a photoresist material may be etched in a plasma containing one (1) part carbontetrachloride (CCl<sub>4</sub>) and one (1) part oxygen in three parts carrier gases, such as argon and carbon monoxide. *Meyer* discloses the critical use of carbontetrachloride (CCl<sub>4</sub>) and oxygen in the etching composition and *Meyer* does not disclose that the carrier gas, such as nitrogen gas as stated in *Kornblit*, is critical.

As previously argued by Applicant, the combined references do not teach or suggest the composition as recited in claims 1-24. There is no suggestion or motivation in the combined references to combine the nitrogen critical dilutant etchant chemistry of

*Kornblit* with the carbontetrachloride (CCl<sub>4</sub>) based etching gas of *Meyer*. Therefore, the rejection based on the combination of *Kornblit* and *Meyer* should be reversed.

*Yasuzato*, which was not used to reject the pending claims as shown in the Examiner's Answer, is asserted as evidence with regard to claim 6 of finding equivalence among chlorine containing gases. Applicants assert that *Yasuzato* is being used in hindsight to rationalize picking and choosing selective gases from the *Kornblit* and *Meyer* processing gases regardless of any suggestion or motivation to combine the subject matter of the respective references. *Yasuzato*, alone or in combination with the subject matter of *Kornblit* and *Meyer*, does not suggest or motivate the combination of carbon monoxide and chlorine gas as etchant species in etching a chromium layer. As *Yasuzato*, is not asserted in a rejection to provide any suggestion or motivation to combine the subject matter of *Kornblit* and *Meyer*, any teaching inferred from the reference supporting the rejection should not be considered.

Applicants further respectfully respond to this asserted reference on the grounds that optimization is limited to within the scope of the references, and is applicable to what is suggested or motivated in the references. As asserted above, there is no suggestion or motivation in the subject matter of the references to use a composition of chlorine and carbon monoxide, and thus, no optimization of the processing parameters with the subject matter of the respective references could be inferred to teach, show, or suggest the subject matter as recited in claims 1-24. Further, if the Examiner is asserting that the combination of constituents, and not the ratios of etching gases as exemplified in the previous Examiner's actions, is based on optimization, the references still lack any suggestion or motivation to combine the respective subject matters to provide a composition; and if such a combination of constituents could be rationalized, which selection of constituents could then be optimized, would as stated earlier be against the teaching of the references, and thus, destroy obviousness.

Thus, at least for the reasons stated above, claims 1, 13, and 20, and claims dependent therefrom, are patentable over *Kornblit* in view of *Meyer*. Therefore, the Appellants submit that claims 1, 13, and 20, and claims dependent therefrom, as they now stand, fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

**CONCLUSION**

For the reasons advanced above, Appellants respectfully urge that the rejection of claims 1-24 as being unpatentable under 35 U.S.C. §103 is improper. Reversal of the rejection in this appeal is respectfully requested.

If necessary, please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 20-0782/4213P1/KMT, and please credit any excess fees to the above referenced deposit account.

Respectfully submitted,



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Keith M. Tackett  
Attorney Reg. No. 32,008  
3040 Post Oak Blvd. Suite 1500  
Houston, TX 77056  
Telephone: (713) 623-4844  
Facsimile: (713) 623-4846  
Attorney for Applicant(s)

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